DOCUMENT RESUME

ED 247 721 EC 170 076

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TITLE Theories and Models of Human Development: Their Implications for the Education of Deaf Adolescents.
PUB DATE Jun 84
NOTE 18p.; Contained in: International Symposium on Cognition, Education, and Deafness (Washington, DC, June 5-8, 1984). Working Papers. Volumes I and II. David S. Martin, Ed.
PUB TYPE Speeches/Conference Papers (150) -- Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adolescents; Child Development; *Cognitive Development; *Deafness; *Egocentrism; Mentors; Social Cognition; *Social Development; Symbolic Learning; Theories
IDENTIFIERS *Piaget (Jean)

ABSTRACT

The review surveys theories and models of human development and extrapolates from these to form a composite sketch of the "typical" deaf adolescent. Theories of J. Piaget are examined and the major stages of cognitive development he proposed are summarized. Implications of concepts of disequilibrium and restructuring of cognitive schemas for deaf adolescents are considered. The nature of egocentrism in deaf adolescents and the social context in which they function are analyzed. The importance of helping deaf adolescents find a balance between challenge and comfort is noted, and the use of mentors or role models is suggested as on approach. (CL)

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THEORIES AND MODELS OF HUMAN DEVELOPMENT: THEIR IMPLICATIONS FOR THE EDUCATION OF DEAF ADOLESCENTS

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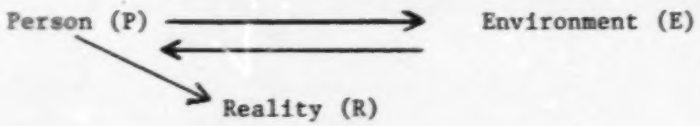
Abstract

This review surveys several relevant theories and models of human development, to extract from these theories and models a composite picture of the period of adolescence from which to extrapolate a parallel composite sketch of the "typical" deaf adolescent.

In his writings on exceptional children, Cruickshank (1963) has noted that a phenomenological approach is useful in helping both the theorist and practitioner to understand the dynamics of behavior and thought. An underlying assumption of this approach is that the person (P) constructs reality out of present and past experience as he* interprets it, using the cognitive tools available at the time of that experience. In this sense, reality (R) is what the person construes it to be from his interaction with the environment (E), as depicted below:



The person (P) in this schema may be conceived (though this is admittedly a simplification) as a product of his construed experience-to-date and the cognitive and affective modalities available to him as a result of this construed experience.

The child's cognitive and affective capacities are themselves developing with increased age from the

simple	to the	complex
concrete	to the	abstract
subjective	to the	objective
familiar	to the	unfamiliar

What cognitive and affective tools does the adolescent person have at his disposal for dealing with the environment?

(1) Most adolescents have reached a certain cognitive level know as formal-operational thought, enabling them to think deductively and hypothetically, to work with propositions instead of objects, and to consider the possible (even the ideal or the fantastic) as opposed to the actual.

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* For economy of presentation, the masculine pronoun is used throughout.

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(2) The adolescent's thinking is, to a greater or lesser extent, "decentered," unlike that of the younger child, whose thinking is egocentric and self-referring.

(3) By this age, many concepts, including the primary concepts of causality, probability, space, time, conservation, and motion which together constitute the foundation for the person's concept of reality, are relatively well developed.

(4) Language development, relative to the adolescent's cultural references group, is virtually complete.

(5) The concept of self, though it will undergo many additional modifications and refinements, is well on the way to complete definition.

(6) At the height of his physical prowess, the adolescent has abundant energy and drive to bring to the resolution of conflicts.

(7) Mental energy can also be channeled into expressions of idealistic thinking and heightened emotion which, when brought to bear on a worthy cause or objective, may result in prodigious accomplishments.

The environment (E) in the diagram above consists of certain expectations imposed by the culture. In some theories, such as Erikson's, these expectations are couched in the terminology of "developmental tasks." For example, in Erikson's theory, the primary task of the adolescent is to "establish his identity." In American culture this means:

(1) Achieving a certain cognitive level of operation (cf. Piaget);

(2) Achieving an acceptable standard of moral beliefs and behavior, including a concept of good citizenship (cf. Kohlberg);

(3) Using communication modes and language appropriate to this age level (cf. Chomsky & Lenneberg);

(4) Developing a healthy self-image, including a concept of one's sex role (cf. Havighurst);

(5) Choosing a vocation (cf. Roe & Super)

Combining the personal (P) and environmental (E) factors enumerated above should provide a reasonably accurate assessment of the adolescent's construction of reality (R). That is to say, the theories should lead to new insights into the cognitive status of the deaf adolescents and some implications for their education.

Introduction

Teaching is an art requiring much skill, dedication, and practice, but success in teaching occurs when that art is built on a foundation of educational science. There is a well-established body of knowledge to undergird teaching practice, but this knowledge is not always appropriately interpreted and applied, nor is it equally well applied in different fields of education.

The field with which we are concerned here is the education of deaf students, especially deaf adolescents, and the area of knowledge (i.e., theory and research) to be explored is that of human development. Specifically, the purpose of the longer and more comprehensive monograph from which this paper (Athey, 1981) was abstracted was: (1) to review several relevant theories and models of human development, (2) to extract from these theories and models a composite picture of the period of adolescence from which (3) to extrapolate a parallel composite sketch of the "typical" deaf adolescent, and finally, (4) to conjecture on the implications of all this for the education of the deaf.

Psychological theorist have by no means agreed on basic assumptions about human nature. Some of the most divisive issues focus upon whether the human organism is inherently reactive or proactive, whether perceptual and cognitive processes are essentially synthetic or analytic, and even upon the nature of the reality we perceive and know. In other words, psychology as a discipline is not yet at the point of having a body of scientific axioms, concepts, and facts that everyone takes for granted as the starting point for further inquiry. This being the case, the practitioner is at liberty to select among the various models, provided that these models do not start from opposite assumptions or lead to contradictory implications.

It should be emphasized at the outset that a theory or model is an exercise in abstraction. The commonalities among people are abstracted and high-lighted in

order to formulate scientific principles that will be capable of generalization to wider segments of the universe of discourse. In this search for principles or laws, theories and models must gloss over those very qualities and characteristics which make the individual unique, since such characteristics do not lend themselves to the scientist's primary goal of prediction. A preoccupation with theory may thus lead to overlooking or the dismissal of these individual qualities. The search for complete understanding requires us to remember, however, that these unique qualities or unique constellations of qualities may be the very factors that permit a person, contrary to all predictions, to be successful in certain life tasks. It is with this caveat that we offer the insights and explanations gleaned from this theoretical review.

Theories of human development may be classified in many ways. In the aforementioned monograph, a complex classification scheme was used to generate a two-way table or grid that would serve as a framework for a review that would be both systematic and unbiased in its treatment of competing theories. In this grid, theories and models were categorized in two ways: (1) by content area, i.e., physical/motor development, cognitive development, language development, emotional and social development, personality development, moral development and vocational or career development (a section on Education theories was also added); (2) by type, i.e., maturational/biological, environmental, and interactionist. Since the focus of this symposium is on cognitive development, we will focus here only that section of the chart that deals with cognitive development with a few incursions into the closely related areas of language development, moral development, and vocational development.

We take it as a given that children's cognitive abilities progress with age along the following dimensions: from the simple to the complex, from the concrete to the abstract, from the subjective to the objective, and from the familiar to

the unfamiliar. All theories must account for these facts, but they do so in very different ways, as we have indicated.

Cruickshank (1963) has suggested that phenomenological models are useful for understanding the dynamics of handicapped children, because they help us to see the world as these children construct it in their perception. An underlying assumption of these models is that at any given time, the person (P) constructs reality (R) out of past and present experience with the environment (E), as interpreted using the available cognitive tools. Hence, in this model, the person (P) is conceived as a product of construed experience-to-date interacting with the cognitive/affective modalities available as a result of this construed experience. A handicapped child's environment (E) is, by definition, restricted. In consequence, the reality (R) that is constructed may be less "differentiated," more simplistic, and lacking in certain distinctions and elaborations.

It is no accident, therefore, that the most useful theory in the cognitive area turned out to be that of Piaget.* We do not normally think of Piaget's theory as phenomenological, but his theory of knowledge bears certain similarities to the characteristics of phenomenological models described above. Since Piaget's theory of learning is closely related to his theory of development, and since both in turn are dependent on his theory of knowledge, it is useful to review the latter in some detail.

We will begin by examining briefly the position that his theory of knowledge occupies in the matrix of epistemological theories deriving from the major schools of philosophical thought. Psychology as an empirical science developed within the

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* In other areas, of course, other theories prove equally useful--Erikson, Lenneberg, Super, to name but a few.

causal-mechanistic framework of British empiricism. In this tradition, knowledge is seen as directly caused by external events to which the organism responds. Images are only faint copies of the real thing, and ideas are even fainter copies, the difference between an image and an idea being merely in degree of acuity (Furth, 1968, 146). The thing or exterior sign causes the interior sign, and this interior sign itself becomes the functional object of knowledge, so that it takes on the power to induce appropriate reactions (e.g., the thought of food has the same power to induce hunger as real food). This viewpoint is in tune with the common-sense notion of how knowledge is acquired, and is deeply ingrained in our cultural heritage. The major topic of debate among psychologists of this persuasion lies in the nature of the internal signs or mediational representations. Piaget's theory of knowledge, by contrast, dispenses with mediational representations in favor of an explanation that relies on two concepts peculiar to his epistemology: assimilation and accommodation. Piaget's early interest in biology provided him with the useful concept of equilibration, which he thought could be profitably applied to the problems of knowledge. Equilibration may be defined as "the internal regulatory factor underlying a biological organization" (Furth, 1969, 261), the process that restores balance or harmony to an organism perturbed by events in its environment. For example, a jellyfish will respond to a blob of ink dropped in its immediate vicinity by swimming away or taking other evasive action. The normal or steady state of the organism is known as equilibrium, and the maintenance of equilibrium appears to be a functional ingredient in the organism's welfare and in the preservation of the species. Like visual acuity or fleetness of foot, intelligence is also a form of adaptation to the environment and as such, Piaget reasoned, it should be capable of explanation by the same principles. His first definitive statement on cognitive development as an

equilibration process appeared in 1957 with the publication of Logique et Equilibre (Flavell, 1963, 3).

Assimilation and accommodation are complementary aspects of the equilibration process. Assimilation is the process by which "every encounter with an environmental object necessarily involves some kind of cognitive structuring (or restructuring) of the object in accordance with the nature of the organism's existing intellectual organization" (Flavell, 1963, 48). Accommodation refers to the changes both in outward behavior and in the internal structures that occur as a result of the assimilation of new information. When both assimilation and accommodation have occurred, the structure is clearer, more sharply defined, and elaborated, and a new level of equilibrium is reached as a consequence. Hence, equilibration is the mechanism by which development takes place, and is a conceptual cornerstone of Piaget's theory.

The functions of assimilation and accommodation that we have described are invariant through life. What then are the "structures" that result from the operations of equilibration? The structures are not invariant with age, but evolve. They are what emerge when the functions operate on the raw data. The changes in the structures give rise to the qualitative differences in thinking at different stages of development.

Growth in intelligence is continuous, but the qualitative differences that emerge are so great that it is possible to discern maturational stages which are rather broadly delimited, subject to wide individual variations in attainment, yet universal in their existence and invariant in sequence. An important feature of stage theories, and one that applies to Piaget's theory, is that each stage builds upon the earlier stages, so that lack of success in the tasks peculiar to one stage will have detrimental effects upon later stages. If we think of the skills to be attained at each level as developmental tasks, we may expect to find

remnants of unresolved tasks from previous stages still affecting behavior at later stages, especially in the case of handicapped and deprived children. For this reason, we will review very briefly Piaget's earlier stages of cognitive development before concentrating on the period of greatest interest, that of adolescence.

Sensorimotor period (0-2 years). Intelligence at this stage consists of coordinating motor responses to external and internal stimulation. Building on the reflexes present at birth, the infant develops various schemata of looking, grasping, etc., which become coordinated into complex responses. The most significant learning that takes place during this period is the understanding of object permanence.

Preoperational period (2-7 years). Once the child has realized that objects continue to exist when they are out of sight and hearing, it becomes possible to substitute for them in thought and action by the use of symbolic representation. The child's use of signifiers to stand for other objects and events is seen in imaginative play. The advent of language provides the child with a much broader repertoire of signifiers and frees the child from the need for immediate concrete experience in order to think about an object.

The major characteristic of this period is egocentrism, by which is meant the inability to "decenter," that is to move outside one's frame of reference (perceptual or experiential). The concept of egocentrism led Piaget to develop a series of famous "conservation" experiments (the "mountain" test, the "balls of clay" and "beakers" tasks, among others) showing the young child's inability to relinquish a particular perspective and to reason about changes (or lack of changes) that must of necessity have taken place in changing that perspective. Egocentrism is also manifest in the child's beliefs about the nature of the physical world and human omnipotence with respect to natural phenomena.

Although egocentrism is a characteristic that is found primarily during the preoperational period, psychologists are coming to realize increasingly that it may also be found in adolescence and adulthood. In times of stress when personal values are threatened, or simply due to lack of socialization in certain spheres of inquiry, on certain topics the adult may display an egocentrism not unlike that of the preschooler.

Concrete-operational period (7-11 years). As the child emerges from the preoperational period, certain skills (or more accurately, modes of thought) become apparent; the ability to order objects on a given dimension such as length, to classify and subclassify objects on one, two, and three characteristics, to conserve number and quantity in spite of physical manipulations, and to reason about cause and effect in the natural world and eventually in the psychological realm. The use of language to represent events is now broadened by the ability to read and write, thus enabling the child to learn from vicarious as well as immediate experience. When the ability to read and write is poorly developed, as is the case with many deaf students, the transition to new levels of operational thought must necessarily be impeded.

"Operations," in Piaget's terminology, refers to the ability to perform intellectual operations on data, and to reason about their relationships.

The chief limitation at the concrete-operational stage is that the child must have the objects present in order to perform these operations. Manipulation in thought comes only at the formal operational level.

Muuss (1975) summarizes the four concrete-operational groupings described by Piaget as follows:

1. Combinativity. Two or more classes may be combined into a single, all-inclusive class, e.g., boys and girls = children. This operation also leads to the realization that the class of children must be larger than the class of boys or girls taken separately.

2. Reversibility. Every logical or mathematical operation is reversible. The class of children may be broken down again into boys and girls. Moreover, children minus boys = girls, and children minus girls = boys. Reversibility is an important index of the child's maturity of thought.

3. Associativity. This operation enables the child to adopt diverse routes to the same goal. If asked to assemble 13 balls of different colors, for example, the child realizes that there are many combinations that satisfy the requirement.

4. Identity or nullifiability. An operation combined with its opposite becomes nullified, e.g., driving one mile west followed by one mile east returns one to the point of origin.

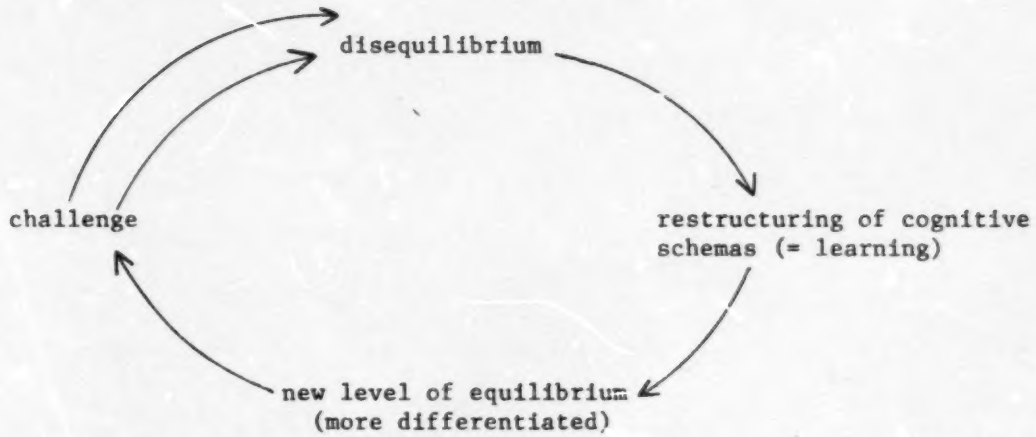
Facility in the above operations makes for flexibility in thinking, again a quality that is sometimes lacking in deaf children.

Formal operational period (11-15 years). This is the final stage of cognitive development, culminating in the ability to use all the intellectual operations of the adult. In contrast to the necessity for immediate experience of the concrete operational period, formal operations are characterized by hypothetical and deductive reasoning. Using propositions instead of objects, the adolescent analyzes a problem and hypothesizes several possible outcomes without acting on any of them. Possibility and probability, as well as reality, assume importance. The reasoning is abstract and logical, hence it can be checked for validity, in addition to being tested against reality. Abstractions are built on abstractions, and operations performed on operations.

As previously noted, since growth is dependent on the assimilation of, and the accommodation to, experience, it is necessarily slow and gradual. The child does not move abruptly from one stage into the next. Similarly, at either end of

any particular stage the child is more likely to resemble a child in the immediately adjacent stage. For example, at the beginning of the formal operational period, between the ages of 11 and 13, the preadolescent is in transition, and it is only during the next two years that the adolescent's thinking begins to approximate that of the adult. Hence it is possible to discern two distinct stages within the formal operational period in which the mind undergoes reorganization.

Another consequence of the gradual nature of intellectual development and its dependence on experience is found in the fact that formal operations may never be reached by some people in certain areas. Growth comes about when new experiences or new information upset the person's mental equilibrium. If the new information is too alien to the person's experience or beyond comprehension, it will, of course, be ignored and thus will not upset the equilibrium. Typically, however, new information does set up a state of disequilibrium, which persists until through assimilation and accommodation, a new level of equilibrium is reached. According to Piaget, at all ages a primary stimulus for disequilibrium is the conversation of other children who are cognitively a little more advanced and thus able to challenge the learner's current beliefs. If deaf children are excluded form such experiences, or their conversations are limited to peers who do not challenge their equilibrium, their world is likely to remain undifferentiated. Moreover, like wealth, knowledge tends to feed upon itself, becoming geometrically self-perpetuating. In this regard, the importance of experiences in early childhood that are conceptually and linguistically challenging cannot be overemphasized. The cyclical causal spiral works as follows:



A deaf child whose early environment contains few stimuli that provoke disequilibrium is unlikely to develop the cognitive structures necessary to proceed to successively higher levels of intellectual functioning. As we noted earlier, the development of operational thinking proceeds from simple to complex, concrete to abstract, subjective to objective, familiar to unfamiliar. Thinking that remains undifferentiated is thus likely to be simplistic, concrete, subjective, and non-risk-taking. In those areas where the child is "unsocialized," to use Piaget's term, thinking remains at a lower operational level. Young deaf children, who remain in an overprotected environment, or who even in school are exposed to drill rather than dialogue, seem especially vulnerable in this regard. A well-developed communication system is clearly at the heart of the entire process. The medium in which this intellectual exchange takes place is probably less critical than the need for early and persistent efforts to establish and nurture opportunities for stimulating communication.

Another important concept in Piaget's theory is that of <u>décalage</u>. He distinguishes two kinds, horizontal and vertical <u>décalage</u>. Vertical <u>décalage</u> refers to the fact that an individual may return to the same problem at different times in the lifespan, using different strategies and modes of thought to address it (a

phenomenon also noted in Erikson's theory). Without higher-level structures, however, deaf children may continue to attack problems in ways that are unproductive or inappropriate for their age level. Horizontal décalage refers to varying levels of attainment in different areas within the same stage; for example, the concrete-operational child at a particular time may have acquired the concept of conservation but not that of classification, or may understand the conservation of number but not that of quantity. In this case, deaf children may have a more uniform, though lower, level of attainment "across the board."

At the formal-operational level, there should be increasing differentiation of mental abilities. Both personal interests and the increased specialization of the secondary school curriculum contribute to this differentiation, but here again, the attainment of these new levels is contingent upon the successful negotiation of earlier stages.

Egocentrism in adolescence. In his paper by this title, Elkind (1974) discusses the unique form that egocentrism takes at each stage of development. Each stage is treated as being primarily concerned with one major cognitive task. The major cognitive task of infancy is "the conquest of the object," and the egocentrism of this stage is seen as the difficulty in differentiating between the object itself and the experience of the object. During the preschool period, the major cognitive task is "the conquest of the symbol," and the egocentrism of this period consists in a lack of differentiation between symbol and referent. With the emergence of concrete operations, the task is that of "mastering classes, relations, and quantities," and here it is the "inability to indifferentiate clearly between mental constructions and perceptual givens" which constitutes the egocentrism of middle childhood.

The major cognitive task of early adolescence is "the conquest of thought." "formal operational thought not only enables the adolescent to conceptualize his

thought, it also permits him to conceptualize the thought to other people... (This is) the crux of adolescent egocentrism" (Muuss, 1962, 43). Adolescents come to believe that other people are as preoccupied with their appearance and behavior as they are. This belief leads to the anticipation of others' reactions and to the construction of an imaginary audience reflecting current feelings about self. The preoccupation with self also leads to the creation of the "personal fable," the belief that one's own feelings and experiences are unique in their intensity. Examples abound that illustrate "how adolescent egocentrism, as manifested in the imaginary audience and in the personal fable, can help provide a rationale for some adolescent behavior," and can also provide "a useful starting point for any attempt to reconcile cognitive structure and the dynamics of personality" (Elkind, 1974).

Again, it is social experience that modifies (though it may not entirely dispel) these elements of egocentric thought. The adolescent comes to realize that members of the peer group are similarly preoccupied with their own fantasies. Still, as Looft (1971, 490) points out, remnants of the personal fable may persist or "go underground;" the adolescent "understands the fallacy of the theory of uniqueness, but affectively continues to derive enjoyment from it in imagination."

We suspect that egocentrism of all types may persist in the operational thought of deaf adolescents. In attempting to determine how well they comprehend academic content, world events, or personal situations, teachers and counselors who deal with deaf students may find Piaget's concepts illuminating and helpful.

Piaget always maintained that language and thought are two separate systems. Though both have their roots in symbolic activity (i.e., both language and thought are ways of representing the world to oneself), and though clearly some relationship exists between the two, they develop separately and in parallel. A corollary

of this proposition is that at any given point in the child's development, language may outstrip thought, or thought may outstrip language (language in this context includes all forms of communication--written, oral, manual, etc.). Again, the educator may find this distinction useful in assessing intellectual ability. Especially in adolescence, verbal facility may obscure the fact that comprehension is superficial. In the case of deaf adolescents, the converse is more likely--that students' grasp of concepts and principles may be underestimated because of their inability to articulate them.

It is perhaps the preoccupation with self noted by Elkind that leads the young person to question the basic meaning and value of human existence. The capacity for abstract thought leads to idealism and euphoria alternating with periods of despair and cynicism. Concern with national and global problems leads to comparisons of what could be with what is, and to an impatience with the imperfections of the social world which adults have created and seem unable or unwilling to change. Political leaders have long recognized the value of harnessing the idealism and energy of youth to particular causes. The capacity for engagement in meaningful social activity is clearly present in young people in every country of the world. The challenge to the behavioral scientist is to help his own country develop the forms and means to enable the adolescent to take a leading role in the struggle for the attainment of a world in which peace, freedom, and economic opportunity are omnipresent. This challenge is particularly severe in dealing with deaf adolescents. Certainly it is desirable that they function to the fullest extent possible as participating citizens of the society, but a judicious appraisal of the forms this participation may take is necessary. It requires a particular form of sensitivity and intuitive awareness of a deaf person's level of functioning to know how and when to advise bold new ventures or when to be content with the consolidation of present achievements. Ultimately, it

is deaf people themselves who must determine how they will construct their world so that a balance between challenge and comfort is achieved. During adolescence persons who serve as mentors and role models would seem to be of critical importance.

We seem to have painted a rather gloomy picture of the deaf adolescent, and we should hasten to add that it does not apply to all of them. It is possible to meet young people who are alert, knowledgeable, socially adept, and realistically oriented toward a vocation. Such individuals provide us with an interesting test of theories and to infer what they mean for the atypical adolescent. The picture is very complex because, given the nature of cognitive growth, one kind of deficiency is likely to lead to other types of deficiency. This is why we end up with a negative picture. On the other hand, a study of those deaf students who do seem to be adjusting to their handicap and coping with the demands and expectations of a frequently unsympathetic world presents a challenge to these theories, as well as a potentially rewarding source of insight.

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Working Paper presented

at the

International Symposium

on

Cognition, Education, and Deafness

Gallaudet College, Washington, DC, June 5-8, 1984